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INFORMATION FOR FOREST MANAGERS: A CASE STUDY OF ADEQUACY AND NEEDS IN MINNESOTA

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ABSTRACT.—Public and private forest managers in Minnesota feel they need better information in such areas as supply and demand, timber growth projections, and reforestation. Needs varied by agency and level of management.

KEY WORDS: Forest resource, forest ownership, administration, timber management, wildlife, recreation, and land use.

Forest managers require many different kinds of information to help them make both day-to-day and longer term decisions. For public forestry agencies, the acquisition of new or additional information is really a capital investment involving the allocation of human and financial resources that may have alternative uses. To use such resources efficiently, forest managers must ask how adequate the existing information is and where can improved information contribute the most to effective decisionmaking. This note summarizes results from a study that addresses these concerns as they pertain to forest management organizations in Minnesota. The study was conducted by the University of Minnesota in cooperation with the North Central Forest Experiment Station.

To assess the adequacy and need for information, we contacted a total of 45 managers within Federal, State, and county forestry agencies and within three of Minnesota's larger forest industries. Because managerial decisions reflect both the level of management and the functional area of the decisionmaker, we questioned individuals at three levels of management—supervisory, central management control, and field operations. Managers at the central staff level were further classified according to their involvement in the functional areas of timber management and land management planning.

We asked managers to evaluate 43 areas of information that we had systematically selected as relevant to the following aspects of forest management: forest resource identification and description; forest land ownership and jurisdiction; forest administration; timber management (biological/silvicultural aspects); timber management (economics and utilization); forest-based wildlife and recreation; forestry legislation; and land use. Managers assessed the adequacy of existing information in each of the areas that were important in their decisionmaking. All items were rated on a five-point scale (very inadequate to very adequate). In addition, managers also selected and ranked the five areas where they felt improvements in quality would most help them make better decisions.

The managers' assessments are presented in table 1 according to level of management, (supervisor, planner, timber manager, field), sector (Federal, State, county, and forest industry), and all groups combined.

Managers at all levels often differentiated between information judged to be inadequate for management decisions and that considered to be of highest priority for improved decisionmaking. In some instances, certain kinds of information were rated as inadequate but were not designated as important priorities and vice versa. For example, among the ten kinds of existing information regarded by all respondents as least adequate for management purposes (Table 1, Column 1), only information on land use projections and forest road systems was rated among the ten most important priority needs from this aggregate standpoint. Conversely, although existing information on forest-sector employment and imports/exports for wood products was regarded as inadequate for decisionmaking, it was assigned a low priority relative to other types of management information.

Forestry supervisors had the greatest tendency to identify information that they deemed inadequate as also of high priority need. They strongly emphasized the importance of future-oriented information related to forest land use, mineral deposits on forest land, and supply and demand for wood products. Information on the use of herbicides and pesticides and the utility of timber growth projections was also important to forest supervisors.

Table 1.--Information inadequacy and priority rankings by levels of management for forest management organizations in Minnesota

Information category	All Groups			Level of management								
				Supervisor			Planner			Timber		
	Inad. 1/ rank	Adeq. 2/ score	Prior. 3/ rank	Inad. rank	Adeq. score	Prior. rank	Inad. rank	Adeq. score	Prior. rank	Inad. rank	Adeq. score	Prior. rank
Mineral deposits: kind/location	1	2.88	12	1	2.69	2	25	3.56		3	2.67	
Forest labor/employment	2	2.89		11	3.22		1	2.86		4	2.73	
Forest road systems	3	2.93	5	4	3.00	11	3	2.88		5	2.93	4
Imports/exports: wood products	4	2.94	32	2	2.70		16	3.43	10	8	3.00	
Land use: projections	5	3.00	9	4	3.00	4	8	3.22		1	2.64	5
Forest soils/geographic regions	6	3.02	11	6	3.08	25	8	3.22	2	12	3.10	14
Land use: regional development	7	3.12	20	7	3.15	5	28	3.67		1	2.64	
Wood residue: supply/demand	8	3.19	13	3	2.83	5	17	3.44		5	2.92	11
Mineral ownership	9	3.22	23	7	3.15	14	33	3.75	10	8	3.00	
Forest land taxes	10	3.24	15	23	3.64	9	7	3.14		15	3.22	
Timber-pulpwood supply/demand	11	3.27	1	7	3.15	1	4	2.89	1	18	3.33	2
Forest land acquistion/disposal	12	3.28	18	16	3.50	17	1	2.86	17	20	3.40	18
Forest soil and water conservation	13	3.30	26	20	3.54	9	11	3.25		5	2.92	
Fuelwood: supply/demand	14	3.36	14	12	3.25		8	3.22	5	16	3.27	8
NIPF landowner assistance	14	3.36	32	29	3.73		26	3.57		13	3.11	18
Herbicide/pesticide usage	16	3.39	5	10	3.18	7	35	3.78		27	3.64	14
Timber growth projections	17	3.40	3	26	3.69	3	12	3.33	2	10	3.08	22
Timber harvests: past/projected	18	3.42	4	15	3.46	13	17	3.44	8	10	3.08	1
Intermediate silvicultural activities	19	3.49	9	14	3.45	11	17	3.44		17	3.31	7
Independent loggers	19	3.49	36	13	3.36		14	3.38		34	3.80	
Forest wildlife: habitat/goals	21	3.50	7	32	3.77	17	6	3.11	4	24	3.50	8
Forest recreation: facilities/users	22	3.57	27	35	3.85	17	12	3.33	13	14	3.17	22
Forest waterways and watersheds	22	3.57	37	16	3.50		17	3.44		30	3.67	
Logging/wood processing technology	24	3.58		31	3.75		28	3.67		21	3.42	
Land use: existing	24	3.58		22	3.62		17	3.44		19	3.36	
Forest management research	24	3.58	22	26	3.69	14	27	3.63		30	3.67	14
Reforestation	27	3.66	2	25	3.67		17	3.44	13	25	3.54	2
Nursery operations	28	3.67	23	29	3.73		33	3.75		27	3.64	14
Wood processors: primary/secondary	29	3.69	30	16	3.50		35	3.78	17	33	3.73	18
Forest insect/disease information	30	3.71	23	23	3.64	17	35	3.78		23	3.45	12
Statutory land class	30	3.71	34	16	3.50	23	28	3.67	20	37	3.89	
Forest management laws: enabling	32	3.74	27	41	4.08	25	14	3.38	6	27	3.64	
Forest management regulations	32	3.74	27	40	4.00	23	24	3.50	13	26	3.58	
Forest land cover/forest types	34	3.77	16	32	3.77	17	28	3.67	10	30	3.67	12
Forest products prices	35	3.79	34	37	3.92		41	4.00		21	3.42	18
Timber harvesting permits	36	3.81		21	3.58		39	3.88		36	3.83	
Timber scaling reports	37	3.86		28	3.70		38	3.86		40	4.00	
Forest ownership/jurisdiction	38	3.88	20	43	4.15	16	5	3.00	13	42	4.10	
Stumpage prices	39	3.93	30	37	3.92	17	40	3.89	17	38	3.92	
Timber sales	39	3.93	18	37	3.92	25	41	4.00		38	3.92	5
Land cover: aerial photographs	39	3.93	8	32	3.77	7	28	3.67	6	43	4.30	
Forest inventory system information	42	3.95	16	41	4.08	25	17	3.44	8	40	4.00	10
Fire protection and control	43	4.02		36	3.91		41	4.00		35	3.82	
Mean adequacy score		3.50			3.53			3.48			3.42	

1/Inadequacy rank: The ranking of the information item according to its positions among all items from lowest to highest adequacy score (i.e.,least adequate item--with lowest adequacy score--ranked number 1);

2/Adequacy score: The average adequacy rating for the item as evaluated according to the adequacy scale.

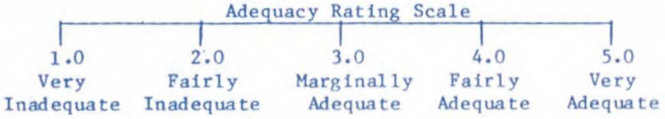
3/Priority rank: Each information item designated as a high priority need was assigned 5 points when ranked as 1st priority, 4 points for 2nd priority, etc., and 1 point for 5th priority; information priority rankings within a given group were obtained by summing priority points for each item and ranking items from highest to lowest sums; a blank priority ranking indicates that no respondent designated the given information item as a high (top-five) priority need.

Forest planners required improved information on supply/demand for timber and fuelwood, timber growth and yield, and projected harvest levels. They stressed the importance of the need for information on forest soils and wildlife populations. They also indicated that existing information on forest ownership/jurisdiction, acquisition, and disposal was often only marginally adequate for the planning process. The lack of these latter kinds of information appears to be much more of a problem for planners than for those within other functional areas of forest management organizations.

Although timber management staff members were least satisfied with the adequacy of existing land use and mineral-related information for management purposes, they indicated that a variety of information on the specific aspects of timber management was of highest priority. This included timber harvesting operations, reforestation, silvicultural treatment systems, and the supply and demand for timber. Timber sales information was assigned a much higher priority by timber management staff than by those at other levels of management.

Field foresters were especially concerned with obtaining better information on reforestation practices and on the use of herbicides and pesticides in forest management. Along with timber management staff members, they placed greater emphasis on the need

Sector													
	Federal			State			County			Industry			
Adeq. score	Prior. rank	Inad. rank	Adeq. score	Prior. rank	Inad. rank	Adeq. score	Prior. rank	Inad. rank	Adeq. score	Prior. rank	Inad. rank	Adeq. score	Prior. rank
2.70	13	7	3.25	11	4	2.64	14	4	2.67	5	2	2.89	
2.80		2	2.88		9	3.00		1	2.25		13	3.38	
2.89	4	22	3.91	21	1	2.23	2	4	2.67	21	3	3.00	3
2.80		14	3.63		3	2.58	14	2	2.33		23	3.57	
3.20			3.00	3	6	2.83	14	7	2.78	1	16	3.44	
2.67	10	25	3.92	14	2	2.40	9	3	2.60	11	3	3.00	8
3.10	16	9	3.31	2	6	2.93		8	2.8	9	16	3.44	
3.70		5	3.08	9	32	3.67	28	6	2.70	11	10	3.22	10
3.10		15	3.64	5	11	3.09		12	3.11		3	3.00	10
2.90	5	1	2.75		11	3.09	3	20	3.33		35	3.78	10
3.70		6	3.23	1	14	3.25	4	30	3.60	5	3	3.00	1
3.20	8	18	3.80	21	8	2.91	7	16	3.30	15	9	3.13	
3.50		10	3.33	11	13	3.17		32	3.70		3	3.00	19
3.70		8	3.27	5	32	3.67	24	16	3.30		8	3.11	8
3.00	16	3	2.89		27	3.50	14	20	3.33		27	3.67	
3.00	1	29	4.00	18	5	2.75	6	15	3.22	1	23	3.63	6
3.50	3	12	3.62	9	19	3.38	19	9	3.10	1	16	3.44	3
3.80	13	25	3.92		31	3.62	9	9	3.10	4	1	2.78	2
3.80	5	29	4.00	14	19	3.38	4	9	3.10	5	13	3.38	18
3.40	13	18	3.80		14	3.25	24	26	3.50		15	3.43	
3.50	7	12	3.62	3	9	3.00	7	34	3.80	9	27	3.67	15
3.90		11	3.38	14	22	3.42	28	34	3.80		35	3.78	18
3.70	16	22	3.91		17	3.27	28	29	3.56		21	3.56	
3.50		16	3.75		27	3.50		13	3.20		38	3.89	
3.90		17	3.77		22	3.42		24	3.44		27	3.67	
3.30		37	4.17	24	14	3.25	11	16	3.30	15	21	3.56	
4.00	1	25	3.92	5	26	3.46	1	30	3.60	11	27	3.67	7
3.56	10	22	3.91	13	24	3.45	24	24	3.44	21	37	3.88	
3.80		20	3.82		40	4.00	19	22	3.40		16	3.44	18
4.00		25	3.92		18	3.33	11	37	3.89		38	3.57	10
3.78		36	4.13		30	3.60	19	26	3.50		26	3.63	
3.70		29	4.00		32	3.67	14	16	3.30	19	40	4.00	
3.80		40	4.18		19	3.38	19	26	3.50	15	40	4.00	
4.00	16	29	4.00	18	42	4.08	28	13	3.20	9	27	3.67	15
3.90		37	4.17		38	3.83		22	3.40	19	27	3.67	
4.00		35	4.08		36	3.69		34	3.80		23	3.57	
3.90		42	4.33		29	3.58		32	3.70		40	4.00	
4.00	10	21	3.83	14	37	3.82	19	41	4.10	15	33	3.75	
4.00		41	4.23		40	4.00	24	38	4.00		11	3.33	15
3.90		37	4.17	18	39	3.92	28	38	4.00		20	3.50	5
4.00	8	29	4.00	5	24	3.45	11	43	4.40	11	38	3.89	19
4.20		29	4.00	21	43	4.33		38	4.00	5	11	3.33	10
4.40		42	4.33		32	3.67		42	4.13		40	4.00	
3.56			3.74			3.36			3.37			3.50	



for better information related to forest road systems than did managers at the supervisory or planning levels. They also identified a variety of information needs associated with administrative aspects of field management, including forest land ownership, acquisition and exchange, and the current tax structure for private forest land. The existing information bases for forest soils and minerals were viewed by field foresters as among those least adequate for their management needs.

Federal managers in Minnesota expressed strong interest in acquiring better information about the supply and demand for wood products and forest land use. Among all sectors they assigned the highest priority to information on forest wildlife and to improvements in the quality of aerial photographs for forest management. Several kinds of information regarded as least adequate for management purposes—i.e., forest taxation, forestry employment, and private landowner assistance—were not ranked as high priority needs.

State forest managers focused upon a core of concrete information priorities related to reforestation, forest roads, silvicultural treatments, and forest soils. Improvements in forest tax information were of greatest interest to managers at the State level, as were those needs associated with the acquisition and disposal of forest land. Information on herbicide and pesticide utilization was considered to be only marginally adequate and an important priority.

County forest and land managers emphasized the importance of information concerning land use trends, mineral deposits, timber growth projections, and harvest scheduling. Managers were particularly emphatic in their desire for better information on the application and effects of herbicides on forest land. Perhaps because their forestry programs have only recently been expanded, county managers placed stronger emphasis on obtaining improved inventory-related information than did other forestry sectors in the State.

Forest industries within Minnesota were most concerned about the ability of public forestry organizations to provide adequate information on the current and future availability of timber. All types of timber supply and demand information were assigned high priorities by industrial managers, and they considered the current information on present and future harvests from public timberland as least adequate for management purposes. Timber management information pertaining to growth and yield, sales, and herbicide/pesticide utilization was regarded as particularly important for improved decisionmaking within industrial firms.

This note has highlighted some of the more significant results of an evaluation of management information by forestry organizations in Minnesota. While the number of individuals who contributed to these evaluations was kept relatively small, the familiarity of participants with information-related problems gives credence to their opinions. These evaluations may constitute an important first step in the improvement of the information resource for forest managers in Minnesota. The relationship of managers' evaluations of the availability and adequacy of this information to the current stock of existing information will also provide a basis for establishing substantive evaluation criteria for future investments in information by forest management organizations in the State.

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